

CLEAN CLAIMS

4. An airport navigation method for a plurality of vehicles selected from the group comprising aircraft and surface vehicles, said method comprising
- a. installing a GNSS reference antenna at a known physical location, said physical location being GNSS referenced;
 - b. preparing a digital map that is GNSS referenced; said map containing at least one digital representation of features selected from the group comprising runways, taxiways, gate areas, geographical features of the area surrounding the airport, topography surrounding the airport, approach paths, departure paths and identified obstructions;
 - c. providing said map to a vehicular navigation computer system;
 - d. receiving GNSS signals at said GNSS reference antenna;
 - e. providing said received GNSS signals to a Differential GNSS base station;
 - f. calculating the differential corrections in said Differential GNSS base station;
 - g. providing said differential corrections to a radio transmitter;
 - h. broadcasting using said radio transmitter, said differential corrections to a vehicle of said plurality vehicles;
 - i. receiving using a radio receiver located on said vehicle said broadcast differential corrections;
 - j. receiving GNSS signals using a GNSS antenna located on said vehicle and providing said received GNSS signals to a differential GNSS receiver located on said vehicle;

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
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(MAILED June 21, 04) APPLICATION # 10/733,968

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- k. providing said received differential corrections to said differential GNSS receiver;
 - l. calculating using said differential GNSS receiver at least one differentially corrected position;
 - m. navigating said vehicle using said differentially corrected position using said vehicular navigation computer system that displays said location of said vehicle on said digital map.
5. An airport control and management method for a plurality vehicles selected from the group comprising aircraft and surface vehicles, said method comprising
- a. installing a GNSS reference antenna at a known physical location, said physical location being GNSS referenced;
 - b. preparing a digital map that is GNSS referenced; said map containing at least one digital representation of features selected from the group comprising runways, taxiways, gate areas, geographical features of the area surrounding the airport, topography surrounding the airport, approach paths, departure paths and identified obstructions;
 - c. providing said map to an airport control and management computer system;
 - d. receiving GNSS signals at said GNSS reference antenna;
 - e. providing said received GNSS signals to a Differential GNSS base station;
 - f. calculating the differential corrections in said Differential GNSS base station;

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- g. providing said differential corrections to a radio transmitter;
 - h. broadcasting using said radio transmitter, said differential corrections to a vehicle of said plurality of vehicles;
 - i. receiving using a radio receiver located on said vehicle said broadcast differential corrections;
 - j. receiving GNSS signals using a GNSS antenna located on said vehicle and providing said received GNSS signals to a differential GNSS receiver located on said vehicle;
 - k. providing said received differential corrections to said differential GNSS receiver;
 - l. calculating using said differential GNSS receiver at least one differentially corrected position;
 - m. broadcasting said differentially corrected position information indicative of said vehicle location using a radio transmitter located on said vehicle;
 - n. receiving said broadcast position information at said control and management computer system;
 - o. presenting said digital map on a display of said airport control and management computer system and
 - p. displaying the location of said vehicle in said presented digital map using said received broadcast position information.
6. An airport navigation system , the system comprising:
- a. a GNSS antenna used to receive broadcast signals from GNSS satellites, said GNSS antenna located at a known location, identified with 3-dimensional GNSS compatible coordinates;

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- b. a differential GNSS base station that receives GNSS signals from said GNSS antenna;
- c. means within said differential GNSS base station to calculate differential corrections consisting of pseudorange corrections;
- d. a radio transmitter connected to said differential GNSS base station;
- e. means within said differential GPS base station to send said pseudorange corrections to said radio transmitter for broadcast;
- f. a radio receiver located on a vehicle selected from the group comprising aircraft and surface equipment;
- g. means on said vehicle to receive said pseudorange corrections using said radio receiver and means to provide said pseudorange corrections to an onboard differential GNSS receiver;
- h. means to calculate a differentially corrected position, indicative of vehicle location using said onboard differential GNSS receiver and received said pseudorange corrections;
- i. a computer with display for presenting a digital map of an airport and surrounding areas;
- j. means to display said differentially corrected GNSS position in a digital map of an airport and
- k. means to navigate said vehicle using said differentially corrected GNSS position presented on said display.

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